REMARKS

Rejection Under 102(e) over Vodges et al.

Claims 1 and 5-8 have been rejected as anticipated by the Vodges reference, U.S. Patent 4,693,940. Applicant respectfully traverses the rejection.

Applicant claims a method in which the interfacial adhesion of a laminate membrane having first and second adjacent thermoplastic layers is increased by annealing at a temperature and time sufficient for a polymeric component to partially diffuse from one of the layers into the other.

The Vodges reference teaches that its adhesion is increased by crosslinking at the interface of incompatible polymers, and it is essential for the Vodges method that each of the layer compositions be radiation crosslinkable. Col. 2, lines 36-44. The Vodges method may include a further step of heating the irradiated, crosslinked interface. In one embodiment, the laminate is heated above the melting points of the compositions for up to 10 minutes. Col. 3, lines 49-57. This apparently deforms the laminate. See Claim 2. In a second embodiment, the laminate with the crosslinked interface is heated for at least 12 hours at a temperature "below the melting point of any polymer . . . ." Col. 3, lines 57-64.

Applicant disagrees with the Examiner's speculation that the Vodges annealing step would inherently produce diffusion of at least one polymeric component into the adjacent layer. If that were the case, then the diffusion should take place as well without the first step of crosslinking. The Examples show a *decrease* in peel strength when the sample is subjected only to the Vodges annealing, which appears to indicate that for the selected Vodges laminate layers no diffusion is taking place. See

Example 1, dose 0 (not crosslinked), bond strength of 2.1 pli without annealing decreased to 1.6 pli when annealed 5 mins./225°C; Example 2, dose 0 (not crosslinked), bond strength of 5.6 pli without annealing decreased to 3.1 pli when annealed 5 mins./150°C; Example 36, dose 0 (not crosslinked), bond strength of 3.6 pli without annealing decreased to 2.2 pli when annealed 10 mins./225°C; Example 37, dose 0 (not crosslinked), bond strength of 3.7 pli without annealing decreased to 1.6 pli when annealed 10 mins./225°C; Example 38, dose 0 (not crosslinked), bond strength of 8.5 pli without annealing decreased to 5.1 pli when annealed 10 mins./225°C; and Example 39, dose 0 (not crosslinked), bond strength of 8.7 pli without annealing decreased to 5.7 pli when annealed 10 mins./225°C.

The Examples thus show that the Vodges annealing step alone does not provide the *increase* in peel strength that would indicate that some diffusion of a polymeric component into the adjacent layer has taken place. We now turn to whether the reported increase in peel strength when annealing follows the irradiation crosslinking step would indicate that a component of one layer has partially diffused into the adjacent layer.

If there is no diffusion under the Vodges annealing conditions without the interfacial crosslinking, it cannot be expected that diffusion will occur after crosslinking covalently bonds interfacial components in place. Because crosslinking vitrifies polymers, the Vodges first step of crosslinking with radiation would hardly serve to promote diffusion across the interface. See Encyclopedia of Polymer Science and Engineering, Volume 4, "Cross-Linking," page 360 ("Glass-transition temperature increases with increasing cross-link density. . . . If a material is cured (cross-linked)

isothermally at cure temperature T_{cure}, the rise in T_g reduces the chain mobility . . . ."); *id.*, Fig. 5.

It seems more likely the Vodges annealing step is accomplishing some change related to the crosslinking itself, perhaps removing stresses introduced by the crosslinking. See Encyclopedia of Polymer Science and Engineering, Volume 2, "Annealing," pages 43-55, at 43 ("The primary reasons for annealing induce the reduction or removal of residual stresses and strains . . . .") and at 46 ("Molded thermoplastics containing residual stresses and frozen-in orientation undergo stress crazing or stress cracking . . . ; these conditions represent the primary modes of plastics failure.").

Therefore, not only does the Vodges reference fail to specifically teach annealing above a thermal transition temperature for a sufficient time to bring about the partial diffusion of Applicant's invention, the Vodges examples appear to demonstrate that the Vodges annealing conditions produce no partial diffusion. Further, the Vodges crosslinking seems to make any such diffusion unlikely.

"Before a reference can be found to disclose a feature by virtue of its inherency, one of ordinary skill in the art viewing the reference must understand that the unmentioned feature at issue is <u>necessarily</u> present in the reference." *SGS-Thomson Mircroelectronics, Inc. v. International Rectifier Corp.*, 32 U.S.P.Q.2d 1496, 1503 (Fed. Cir. 1994) (citing *Continental Can Co. USA Inc. v. Monsanto Co.* 20 U.S.P.Q.2d 1746, 1749 (Fed. Cir. 1991)) (emphasis added). To be "necessarily present" the feature must *always* be present in what the prior reference describes. *W.L. Gore & Associates v. Garlock, Inc.*, 220 U.S.P.Q. 303, 314 (Fed. Cir. 1983) (no anticipation

where the claimed product had a "unique nature" and the processes of the prior references would not always inherently "produce products meeting all of the claim limitations"). Thus, an anticipating reference must enable one of ordinary skill in the art to select those embodiments that provide the particular advantage of the claimed invention when that advantage is not always available in practicing the prior reference's process. By the same token, a feature that is not always available in the prior process cannot be inherent in that process, for its enjoyment depends on a fortuitous selection of parameters that is not taught or hinted at in the reference.

The presently claimed annealing for a time sufficient for partial diffusion is <u>not</u> a necessary result of the Vodges method. None of the Examples demonstrate temperatures under which partial diffusion appears to take place. Instead, one would have to careful select conditions under which such partial diffusion might occur. The Vodges patent provides no guidance on such a selection – the inferences one would draw from the examples is that there is no diffusion taking place in the Vodges method.

For these reasons, Applicant submits that the Vodges reference does not anticipate the present invention. Applicant respectfully requests withdrawal of the rejection and reconsideration of the claims.

<u>Rejection Under 103(a) Over Vodges et al. in View of Bonk et al.</u>

Claims 1, 2, and 4-29 have been rejected as unpatentable over the Vodges reference, U.S. Patent 4,693,940, in view of the Bonk reference, U.S. Patent No. 6,082,025. Applicant respectfully traverses the rejection.

The shortcomings of the Vodges reference have already been discussed. Even were the secondary reference to teach the features alleged in the office action, the combination would still not suggest a method in which the laminate is annealed above a thermal transition temperature of a polymeric component for a time sufficient for that component to partially diffuse into the adjacent layer.

Further, Applicant notes that crosslinked polymers in general are not deemed thermoplastic. See, Encyclopedia of Polymer Science and Engineering, Vol. 4, "Crosslinking" at page 350 (2d ed. 1986) ("Cross-linking reactions are those that lead to the formation of insoluble and infusible polymers in which chains are joined together to form a three-dimensional network structure.") (citations omitted); *Id.,* Vol. 16, "Thermosetting Polymer" at page 833 ("A thermosetting polymer is one that is capable of being changed into a substantially infusible or insoluble product when cured by heat or other means. The cured polymer may be termed thermoset.") (footnote and citation omitted).

There is, moreover, no apparent motivation to incorporate the Bonk materials into the Vodges reference, as the Vodges reference is concerned with shaped articles such as heat-shrinkable articles, for which low temperature flexibility, solvent resistance, and high dielectric strength are important. Col. 1, lines 18-42. The primary reference does not mention the materials of the Bonk laminate nor suggest their utility. The Vodges reference also does not provide any motivation for forsaking its shaped, heat-shrinkable articles for inflated bladders and shoes. It is insufficient for a prima facie obviousness that if one reference teaches A and a second reference teaches B, the references could be put together to get both A and B of a claim; that is

an impermissible hindsight analysis. See, e.g. *In re Rouffet,* 47 USPQ2d 1453, 1457 (Fed. Cir. 1998) ("To prevent the use of hindsight based on the invention to defeat patentablity of the invention, this court requires the examiner to show a motivation to combine the references that create the case of obviousness.").

In view of the deficiencies of the cited references, Applicant respectfully requests reconsideration and allowance of the claims.

Rejection Under 103(a) Over Vodges et al. in View of Wang et al.

Claim 3 has been rejected as unpatentable over the Vodges reference, U.S. Patent 4,693,940, in view of the Wang reference, U.S. Patent No. 6,124,007. Applicant respectfully traverses the rejection.

Again, the shortcomings of the Vodges reference have already been discussed. Even were the secondary reference to teach the features alleged in the office action, the combination would still not suggest a method in which the laminate is annealed above a thermal transition temperature of a polymeric component for a time sufficient for that component to partially diffuse into the adjacent layer.

Again, it appears that the Vodges reference does not disclose thermoplastic layers, since its layers are radiation crosslinkable and, in fact, are crosslinked in its method.

Further, Applicant sees no motivation for one practicing the Vodges method to substitute the Wang reference materials. It is not readily apparent how the Vodges method and the Wang method could be combined, when the first involves crosslinking and the second involves oriented, stretched materials.

Finally, there is no apparent motivation for one practicing the Vodges method to select a particular material from the Wang reference, particularly since the Vodges patent makes no mention of the burst strength with which the Wang reference is concerned. It is unclear why one making the heat-shrinkable articles mentioned by the Vodges patent would look to a material with high burst strength, as heat shrinking and inflation would be moving in opposite directions.

In view of the deficiencies of the cited references, Applicant respectfully requests reconsideration and allowance of this claim.

Rejection Under 103(a) Over Vodges et al. in View of Bonk et al. and Further in View of Wang et al.

Claim 3 has been rejected as unpatentable over the Vodges reference, U.S. Patent 4,693,940, in view of the Bonk reference, U.S. Patent No. 6,082,025, and further in view of the Wang reference, U.S. Patent No. 6,124,007. Applicant respectfully traverses the rejection.

This rejection is word for word the same as the rejection over the Vodges reference, U.S. Patent 4,693,940, in view of the Wang reference, U.S. Patent No. 6,124,007. The Bonk reference was not applied. Applicant, therefore, reiterates the argument set out in the above section.

In view of the deficiencies of the cited references, Applicant respectfully requests reconsideration and allowance of this claim.

The Examiner is invited to telephone the undersigned if it would be helpful for resolving any issue.

Respectfully submitted,

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